

CLAIMS

What is claimed is:

- 1 1. A method for translating between logical addresses and ports of a first network and a
2 logical address and ports of a second network connected to the first network at an
3 intermediate device, the method comprising the computer-implemented step of:
4 receiving at the intermediate device a first packet from a first device having a first
5 address on the first network;
6 sending a second packet to a second device on the second network in response to
7 receiving the first packet, the second packet including, in a source address
8 field, data indicating a particular address of the intermediate device on the
9 second network;
10 determining whether the first packet includes a first message that registers a first
11 resource on the first device with a protocol server for a particular protocol, the
12 protocol server available at the second device on the second network; and
13 if it is determined that the first packet includes the first message registering the first
14 resource, then
15 determining first information in the first message for uniquely requesting the
16 first resource, and
17 storing data indicating the first information in a first data structure in
18 association with the first address.
- 1 2. A method as recited in Claim 1, further comprising the computer-implemented step
2 of:
3 receiving at the intermediate device a third packet from a third device on the second
4 network;
5 determining whether the third packet includes a second message requesting a second
6 resource according to the particular protocol; and
7 if it is determined that the third packet includes the second message requesting the
8 second resource, then

9 determining second information in the second message for uniquely requesting
10 the second resource,
11 determining whether the second information matches the first information in
12 the data structure, and
13 if the second information matches the first information, sending the second
14 message to the first device having the first address associated with the
15 first information.

1 3. A method as recited in Claim 1, wherein, if it is determined that the first packet
2 includes the first message, then inserting in the second packet a second message based on the
3 first message.

1 4. A method as recited in Claim 3, wherein the second message is the same as the first
2 message.

1 5. A method as recited in Claim 3, further comprising the computer-implemented step of
2 generating the second message by replacing, in a source address field, data indicating the first
3 address with data indicating the particular address of the intermediate device on the second
4 network.

1 6. A method as recited in Claim 1, wherein.
2 a source port field in the first packet includes data indicating a first source port;
3 said step of sending the second packet to the second device further comprises
4 storing in a second data structure uniquely associated with the first address and
5 the first source port a particular translated port, and
6 inserting data indicating the particular translated port into a source port field of
7 the second packet.

1 7. A method as recited in Claim 1, wherein the particular protocol uses a well-known
2 port for requesting the first resource:

- 1 8. A method as recited in Claim 1, wherein the particular protocol is a network basic
2 input and output system (NetBIOS) open protocol.
- 1 9. A method as recited in Claim 1, wherein the protocol server is a network basic input
2 and output system (NetBIOS) name server.
- 1 10. A method as recited in Claim 1, wherein the first information is a resource name.
- 1 11. A method as recited in Claim 5, wherein the protocol server is a name server that
2 stores a resource name of the first resource in the second message in association with an
3 address based on data in the source address field of the second message.
- 1 12. A method as recited in Claim 1, wherein the protocol server is a name server that
2 stores data indicating a resource name of the first resource, and does not store data in a source
3 port field of the second packet in association with the resource name.
- 1 13. A method as recited in Claim 2, wherein the third packet includes, in a destination
2 address field, data indicating the particular address of the intermediate device.
- 1 14. A method as recited in Claim 2, said step of determining whether the third packet
2 includes the second message comprising determining whether a destination port field in the
3 third packet includes data indicating a well-known port associated with requesting a resource
4 according to the particular protocol.
- 1 15. A method as recited in Claim 1, further comprising the computer-implemented steps
2 of:
3 monitoring messages associated with registering the first resource with the protocol
4 server;
5 determining whether the first resource is not registered with the protocol server; and

6 if it is determined that the first resource is not registered with the protocol server, then
7 removing from the first data structure the data indicating the first information
8 in association the first address.

1 16. A method for translating between logical addresses and ports of a first network, and a
2 logical address and ports of a second network connected to the first network at an
3 intermediate device, the method comprising the computer-implemented steps of:
4 receiving a first packet at the intermediate device from a first device not on the first
5 network,
6 sending a second packet to a second device on the first network in response to
7 receiving the first packet, the second packet including, in a destination address
8 field, data indicating a translated address;
9 determining whether the first packet includes a first message requesting a resource
10 according to a particular protocol; and
11 if it is determined that the first packet includes the first message requesting the
12 resource, then
13 determining first information in the first message for uniquely requesting the
14 resource, and
15 before said step of sending the second packet, determining the translated
16 address on the first network based on a data item in a first data
17 structure, the data item indicating the translated address and the first
18 information.

1 17. A method as recited in Claim 16, wherein, if it is determined that the first packet
2 includes the first message, then inserting in the second packet a second message based on the
3 first message.

1 18. A method as recited in Claim 17, wherein the second message is the same as the first
2 message.

1 19. A method as recited in Claim 16, wherein the particular protocol uses a well-known
2 port for requesting the resource.

1 20. A method as recited in Claim 16, wherein the particular protocol is a network basic
2 input and output system (NetBIOS):open protocol.

1 21. A method as recited in Claim 16, wherein the first information is a resource name.

1 22. A method as recited in Claim 16, wherein the first packet includes, in a destination
2 address field, data indicating a particular address of the intermediate device.

1 23. A method as recited in Claim 16, said step of determining whether the second packet
2 includes the first message comprising determining whether a destination port field in the first
3 packet includes data indicating a well-known port associated with requesting a resource
4 according to the particular protocol.

1 24. A method as recited in Claim 16, wherein the first device obtains the first information
2 from a protocol server that is not on the first network.

1 25. A method as recited in Claim 24, wherein the protocol server is a network basic input
2 and output system (NetBIOS) name server.

1 26. A computer-readable medium carrying one or more sequences of instructions for
2 translating between logical addresses and ports of a first network, and logical addresses and
3 ports of a second network connected to the first network at an intermediate device, which
4 instructions, when executed by one or more processors, cause the one or more processors to
5 carry out the steps of:

6 receiving at the intermediate device a first packet from a first device having a first
7 address on the first network;

8 sending a second packet to a second device on the second network in response to
9 receiving the first packet, the second packet including, in a source address
10 field, data indicating a particular address of the intermediate device on the
11 second network;
12 determining whether the first packet includes a first message that registers a first
13 resource on the first device with a protocol server for a particular protocol, the
14 protocol server available at the second device on the second network; and
15 if it is determined that the first packet includes the first message registering the first
16 resource, then
17 determining first information in the first message for uniquely requesting the
18 first resource, and
19 storing data indicating the first information in a first data structure in
20 association with the first address.

1 27. A computer-readable medium carrying one or more sequences of instructions for
2 translating between logical addresses and ports of a first network, and logical addresses and
3 ports of a second network connected to the first network at an intermediate device, which
4 instructions, when executed by one or more processors, cause the one or more processors to
5 carry out the steps of:
6 receiving a first packet at the intermediate device from a first device not on the first
7 network,
8 sending a second packet to a second device on the first network in response to
9 receiving the first packet, the second packet including, in a destination address
10 field, data indicating a translated address;
11 determining whether the first packet includes a first message requesting a resource
12 according to a particular protocol; and
13 if it is determined that the first packet includes the first message requesting the
14 resource, then
15 determining first information in the first message for uniquely requesting the
16 resource, and

17 before said step of sending the second packet, determining the translated
18 address on the first network based on a data item in a first data
19 structure, the data item indicating the translated address and the first
20 information.

1 28. An apparatus for translating between logical addresses and ports of a first network,
2 and logical addresses and ports of a second network connected to the first network at an
3 intermediate device, comprising:
4 means for receiving at the intermediate device a first packet from a first device having
5 a first address on the first network;
6 means for sending a second packet to a second device on the second network in
7 response to receiving the first packet, the second packet including, in a source
8 address field, data indicating a particular address of the intermediate device on
9 the second network;
10 means for determining whether the first packet includes a first message that registers a
11 first resource on the first device with a protocol server for a particular
12 protocol, the protocol server available at the second device on the second
13 network;
14 means for determining first information in the first message for uniquely requesting
15 the first resource, if it is determined that the first packet includes the first
16 message, and
17 means for storing data indicating the first information in a first data structure in
18 association with the first address, if it is determined that the first packet
19 includes the first message.

1 29. An apparatus for translating between logical addresses and ports of a first network,
2 and logical addresses and ports of a second network connected to the first network through
3 the apparatus, comprising:
4 a first network interface that is coupled to the first network for sending and receiving
5 messages thereon;

6 a second network interface that is coupled to the second network for sending and
7 receiving messages thereon;
8 a processor;
9 one or more stored sequences of instructions which, when executed by the processor,
10 cause the processor to carry out the steps of:
11 receiving at the intermediate device a first packet from a first device having a
12 first address on the first network;
13 sending a second packet to a second device on the second network in response
14 to receiving the first packet, the second packet including, in a source
15 address field, data indicating a particular address of the intermediate
16 device on the second network;
17 determining whether the first packet includes a first message that registers a
18 first resource on the first device with a protocol server for a particular
19 protocol, the protocol server available at the second device on the
20 second network; and
21 if it is determined that the first packet includes the first message registering the
22 first resource, then
23 determining first information in the first message for uniquely
24 requesting the first resource, and
25 storing data indicating the first information in a first data structure in
26 association with the first address.